

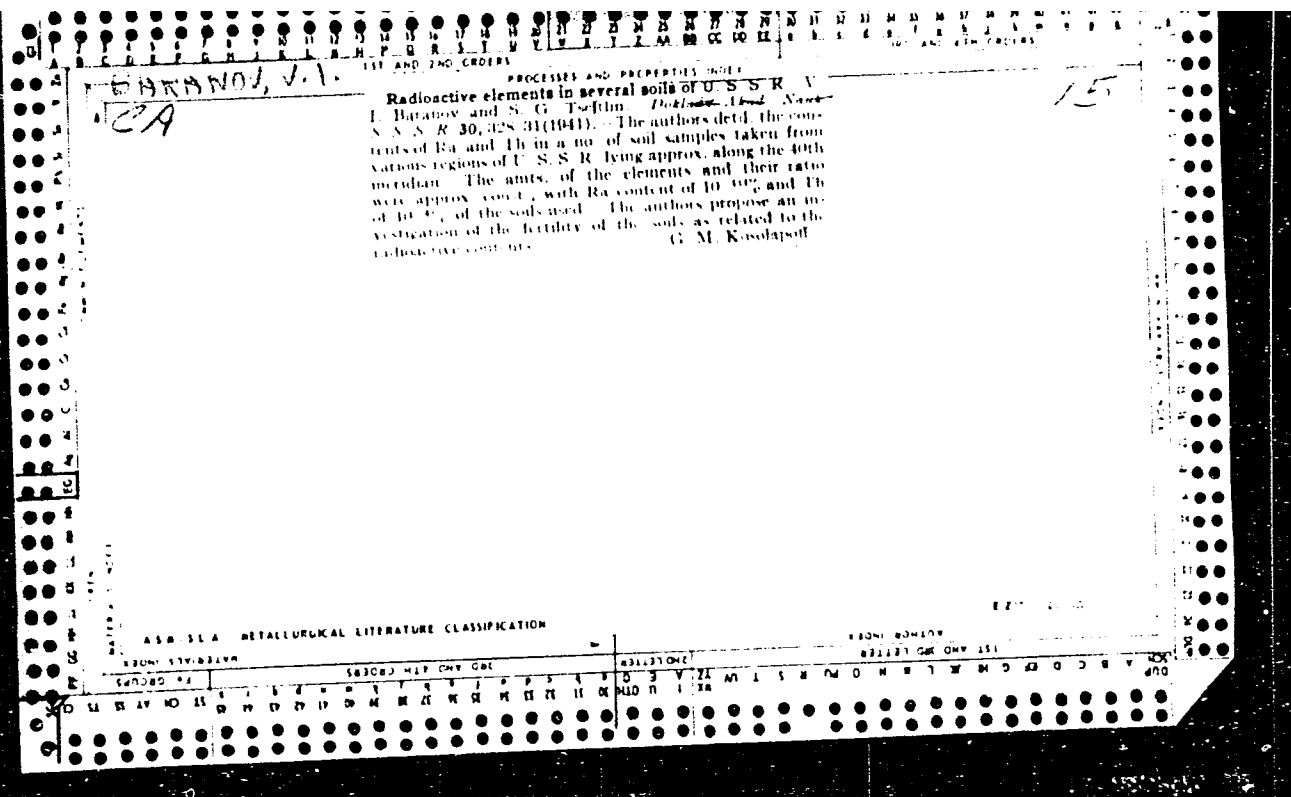
BASIN, T. I.,

Basin, T. I., and Muelers, W. J. "On the Collective Behavior of the Ground and  
the Atmosphere." ~~Proceedings of the~~ Ann. N.Y. Acad. Sci., Series B, Vol. 1, No. 1, 1958, pp. 1-10.

A-4

**Assimilation of radioactive elements by plants.**

V. I. BARANOV (Compt. rend. Acad. Sci. U.R.S.S., 1939, 24, 951—954).—*Lactuca sativa* and *Pisum sativum* grown in culture media containing optimum concns. of Ra, Ac, and U contain a higher (up to 160 times) concn. of radioactive material than the culture medium, the roots having a greater concn. than the aerial organs. When these elements are supplied in high concn. much less is absorbed by the plant. Optimum concns. of the elements exhibit approx. equal radioactive energies. J. L. D.



BARANOV, V.I.

Content of radioactive elements in some soils of the U.S.S.R.  
V. I. Baranov and S. G. Zeltin (*Compt. rend. Acad. Sci. U.S.S.R.*,  
1941, **80**, 330-333) - Soils on lat. 40° N. were examined. The  
content of Ra and Th in all the soils investigated was of the same  
order, viz., 10-10% Ra and 10-4% Th. The ratio Th/Ra is approx.  
the same in all cases, the average being  $6.9 \times 10^4$ , which is approx.  
the same as the Th/Ra ratio in rocks. The emanation power of  
the soils was also determined. They all emit an appreciable amount  
of Rn and Tn. The emanating power is, on the average, 41% Rn  
and 45% Tn. A. J. M.

130-46  
LARNING, J.Y.

Content and determination of actinium and its products in mineral waters. V. I. Baranov and S. G. Zolotarev (U.S.S.R.). *Tr. Akad. Nauk SSSR, 1941, 22, 403-405*. Contents of Ac, X, Ac, Ra, and Th X in two Caucasian spring waters and a ferruginous sediment from one of the springs are recorded, and discussed in relation to the mechanism of the removal of the radioelements from underlying deposits. Ra and Ac are conc. in the sediment. V. I. W.

CHAMBER, J. I.

**Application of radio-chemical analysis for the correlation of geological strata.** V. I. Baranov, R. I. Kuznetsov and S. G. Fedotina. *Dokl. Akad. Nauk SSSR*, 1963, 178, 1190. Cores from test oil borings in the Kazan Area were examined. The cores were from the lower Permian and upper Carboniferous strata. The average concn of Ra in the cores was  $5.38 \cdot 10^{-10}$ , and of Th  $1.09 \cdot 10^{-10}$ . Well waters examined had [Ra] of the same order.  $\alpha$  H.

[illegible]

Also: Iz. Ak. Nauk SSSR, Otdel. Tekh. Nauk, No. 3, 1943.

Biogeochem. Lab., Inst. Geochem. & Anal. Chem. im. V. I. Vernadskiy, Dept.  
Chem. Sci., AS.

BARANOV, V. I.

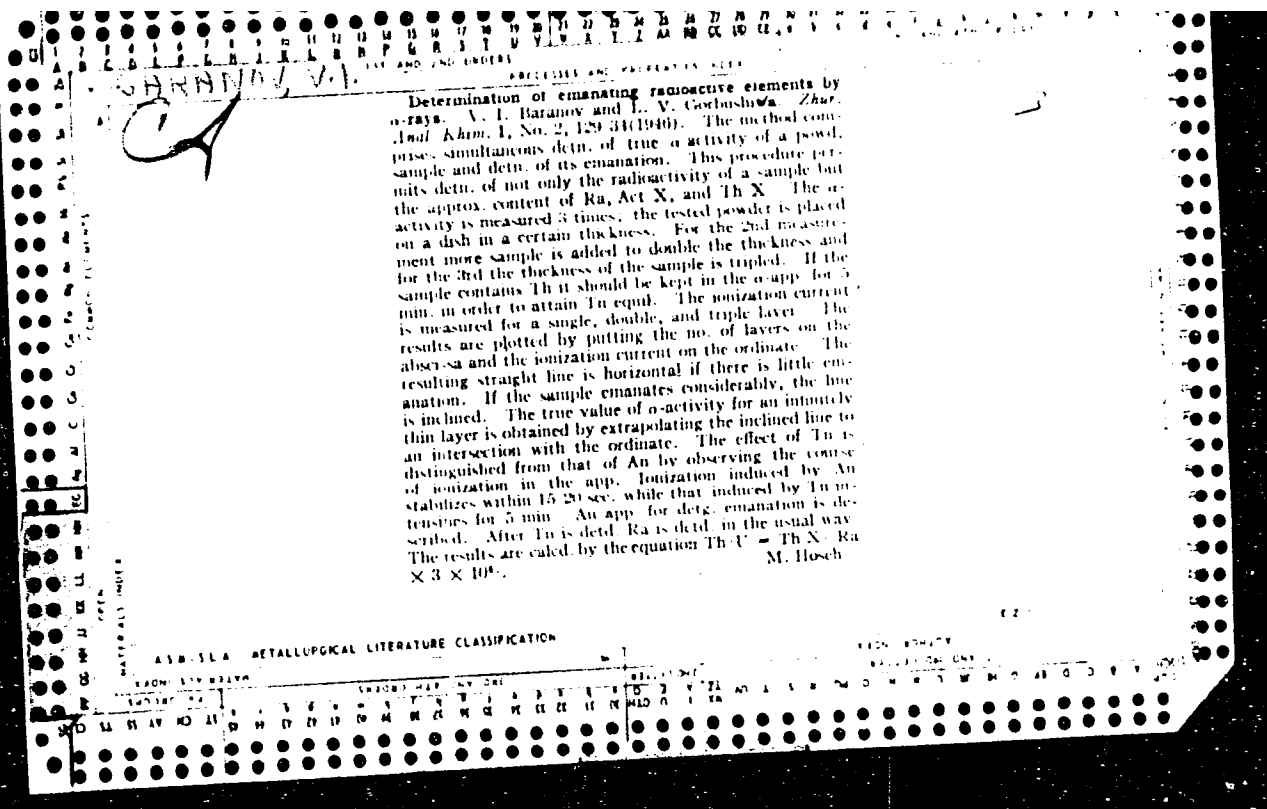
"Radioactivity of the Sungul Peat Muds," Iz Ak Nauk SSSR, Ser. Geograf. i  
Geofiz., No 3, 1943.

Biogeochemical Lab., Acad. Sci., Central Inst. Health Resorts, NKZ.

Application of the method of microradiography for the clarification of the character of distribution of radioactive elements in natural objects. V. I. Baranov, A. P. Zolotarev and M. Yu. Dekhutol Mysenskaya. *Dokl. Akad. Nauk SSSR*, 1944, 20: 8. English summary. —Thick-layered photographic plates were used for the study of distribution of radioactive elements on surfaces of sedimented minerals and of plant tissues. Count of residual particles under the microscope permits judgment of such distribution. The technique is applicable for the study of Ra distribution. Ra distribution in *Elodea* grown in Ra-enriched water is analogous to distribution of Neutral Red dye under living conditions of the plant. G. M. Kosolapoff

Also: Iz. Ak. Nauk SSSR, Otdel. Khim. Nauk, No. 1, 1944.  
V. I. Vernadsky Lab. of Geochem. Problems and Radium Inst., AS USSR.





BARANOV, V.I.; NOVITSKAYA, A.P.

Diffusion of radon in native muds. Trudy Biogeokhim. Lab., Akad. Nauk  
S.S.S.R. No.9, 163-71 '49. (MLRA 6:5)  
(GA 47 no.16:8319 '53)

BARANOV, V.I.; NOVITSKAYA, A.P.

Abstract of report

Absorption of radon by native muds. Trudy Biogeokhim. Lab., Akad. Nauk  
S.S.S.R. No.9, 175-80 '49. (MLRA 6:5)  
(CA 47 no.16:8319 '53)

BARANOV, V.I.; NOVITSKAYA, A.P.

Dynamics of gas exchange during respiration of air containing thoron.  
Trudy Biogeokhim. Lab., Akad. Nauk S.S.S.R. No.9, 183-9 '49. (MLRA 6:5)  
(CA 47 no.16:8208 '53)

BOYCHENKO, Ye.A.

BOYCHENKO, Ye.A.; BARANOV, V.I.; OPARIN, A.I., akademik.

Photoreduction of carbon dioxide tagged with  $C^{14}$ , by chloroplasts outside the cell. Dokl. AN SSSR 91 no.2:339-341 J1 '53. (MLBA 6:6)

1. Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo Akademii nauk SSSR. 2. Akademiya nauk SSSR (for Oparin).  
(Carbon--Isotopes) (Photosynthesis)

(CA 47 no.21:11360 '53)

KUKARKIN, B.V., doktor fiziko-matematicheskikh nauk, redaktor; PA-  
RIYSKIY, N.N., kandidat fiziko-matematicheskikh nauk, redaktor;  
BARANOV, V.I., doktor fiziko-matematicheskikh nauk, redaktor;  
BELOUSOV, V.V., redaktor; LEVIN, B.Yu., kandidat fiziko-ma-  
tematicheskikh nauk, redaktor. MASEVICH, A.G., kandidat fiziko-  
matematicheskikh nauk, redaktor; SAFRONOV, V.S., kandidat fi-  
ziko-matematicheskikh nauk, redaktor.

[Problems in cosmogony] Voprosy kosmogonii. Moskva, Izd-vo  
Akademii nauk SSSR. Vol 2. 1954. 363 p. (MLRA 7:8)

1. Chlen-korrespondent AN SSSR (for Belousov) 2. Akademiya  
nauk SSSR.  
(Cosmogony)

BOYCHENKO, Ye.A.; BARANOV, V.I.

Role of iron organic compounds in the photoreduction of carbon dioxide by isolated chloroplasts. Dokl. AN SSSR no.5:1025-1027 Ap '54.  
(MLRA 7:4)

1. Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo Akademii nauk SSSR. Predstavleno akademikom A.P.Vinogradovym.  
(Iron organic compounds) (Photosynthesis) (Carbon dioxide)

BARANOV, V.I., doktor fiziko-matematicheskikh nauk.

How old is the earth? Vokrug sveta no.9:8-9 S '54. (MLRA 7:10)  
(Earth--Age)



Baranov, V. I.

U S S R .

✓ Content of radioactive elements of the thorium series in plants. V. I. Baranov and K. G. Kunasheva. *Trudy Biogekhim. Lab.*, 2-23, Nauk S.S.S.R. 10, 64-7(1964).— Natural water-floating plants do not assimilate Th isotopes from the aq. environment because in this medium the equil. among the elements of the Th series is destroyed by the lack of Th isotopes. The soil-growing plants, however, do assimilate Th isotopes and Ra isotopes in amounts proportional to their content in the soil. The plants assimilate all elements of the Th series from an artificial aq. soln. Radiothorium assimilation cannot be used as proof of mobility of Th in soil since the products of its decay may acquire mobility in the process of decay. G. M. Kosolapoff

reduction of carbon dioxide by isolated chloroplasts. E. A. Bolchenko and V. I. Baranov. Doklady Akad. Nauk S.S.S.R. 93, 1025-7 (1954). C.A. 47, 11360c. The frequently observed considerable variations of activity of isolated chloroplasts in expts. with photoreactions of  $C^{14}$ -labeled atm.  $CO_2$  have been traced to the presence of Fe. The content of Fe varies by as much as 100% in white clover and primula specimens over a period of 1-4 months. Generally the highest activity was found in specimens that had been less thoroughly washed; however, no direct correlation between Fe content and activity was found. When the

chloroplasts were treated with an enzyme prepn. described by Fager (C.A. 47, 699d) the activity of the former rose 5-fold or more. Nevertheless, even such specimens showed considerable variation in activity. If the enzyme prepn. is redissolved in 60%  $Me_2CO$  acidified with 0.01N  $HCl$ , approx. 80% of the original ppt. goes into soln. Examn. of this residue for Fe showed that the residues from very active prepn. contained 25-54 times more Fe than those from less active specimens. Thus the fraction added to the chloroplasts consisted largely of polyuronides with a high content of org. Fe, possibly of hemin type. The enzyme prepn. is similar to the complex which is separable from chloroplasts on boiling with  $H_2O$  both in polyuronide and org. Fe content. The more active natural chloroplasts contain larger amts. of this complex; it is able to fix  $C^{14}O_2$  even in the absence of chloroplasts, but its activity is very much higher in their presence. The products remain for some time in the vicinity of the enzyme and are aq. substances which give red color with naphthorescinol. This extracellular reduction of  $CO_2$  is similar to previously described phenomenon (cf. Kuzin, et al., C.A. 44, 10556d; Doman, C.A. 48, 7711d).

G. M. Krasolapoff

BARANOV, V. I.

USSR/Geology - Geochemistry

Card : 1/1

Authors : Baranov, V. I. and Kuz'mina, L. A.

Title : Ionium method of determining the increase of sea sediments. Direct determination of ionium.

Periodical : Dokl. AN SSSR, 97, Ed. 3, 483 - 485, July 21, 1954

Abstract : The three basic stages of the method, for determining the ionium content of sea sediments, are described. A special analysis system was adopted for the solution of the many problems involved in direct ionium determination. This analysis system was found suitable in all three stages because the ionium is in the sediment and this warrants complete separation and eliminates losses due to adsorption. The results obtained with the ionium method, are given in table 1. Ten references: 5-USSR and 5-USA. Graph, drawing.

Institution : Acad. of Sc. USSR, The V. I. Vernadskiy Institute of Geochemistry and Anal. Chem.

Presented by : Academician, A. P. Vinogradov, March 25, 1954

STARIK. I.Ye., redaktor; SHCHERBAKOV, D.I., akademik, redaktor; VINOGRADOV, A.P., akademik, redaktor; POLKANOV, A.A., akademik, redaktor; SHATSKIY, N.S., akademik, redaktor; BARANOV, V.I., professor, redaktor; PEKARSKAYA, T.B., kandidat geologo-mineralogicheskikh nauk, redaktor; CHERDYNTSEV, V.V., redaktor; POLYAKOVA, T.V., tekhnicheskii redaktor.

[Transactions of the third session of the Committee for Determining the Absolute Age of Geological Formations, March 25-27, 1954] Trudy tret'ei sessii, 25-27 marta 1954. g. Moskva, 1955. 260 p. [Microfilm] (MLRA 9:1)

1. Akademiya nauk SSSR. Komissiya po opredelniya absolyutnogo vozrasta geologicheskikh formatsii. 2. Chlen-korrespondent AN SSSR (for Starik). (Geological time)

BARANOV, V.I.; VINOGRADOV, A.P., akademik, redaktor; MYASNIKOV, I.A.  
redaktor; STRUCHKOV, Yu.T., redaktor; MOSKVICHEVA, N.I., tekhnicheskii redaktor.

[Radiometry] Radiometriia. Moskva, Izd-vo Akademii nauk SSSR,  
1955. 327 p. (MLRA 8:12)  
(Radiation--Measurement)

DAK H/VOY, V. L.

"The Search for Occurrences of Uranium and Thorium by Aero-radiometric Methods and the Interpretation of Gamma Anomalies," by V. I. Baranov, Issledovaniya v Oblasti Geologii, Khimii, i Metallurgii (Investigations in the Fields of Geology, Chemistry, and Metallurgy), Academy of Sciences USSR, Moscow, 1955, pp 11-20 (from Referativnyy Zhurnal -- Geologiya, No 2, Feb 57, pp 172-173, Abstract No 2257 by A. P. P.)

"In searching for deposits of radioactive ores from planes, two methods have been tried in the USSR, i. e., the aeroionization method and the aerogama method. When the aeroionization method is used, a large number of false anomalies is obtained because of extraneous sources of ionization and because of the presence of space-charges in the atmosphere. The exact localization of anomalies is also made difficult because of the transportation of radon and of the products of its decay by air currents. For these reasons, the ionization method has limited applicability.

Sum. 1360

The principal aeroradiometric method is the gamma method, which has been developed to the greatest extent both as far as equipment and procedures of applying it are concerned. When terrestrial and subsurface measurements are made, the results can be interpreted quantitatively. In other words, the determination of the content of radioactive elements in rocks can be made directly on the basis of the readings of devices for geophysical measurements. When measurements are made from a plane, difficulties arise in the interpretation of the results from the geophysical standpoint. These difficulties are connected with the absorption and dispersion of gamma radiation in the air and with other specific obstacles of a different nature. A number of examples is given and formulas for calculation are cited which enable one to reduce errors in observation and to avoid difficulties in the interpretation of measurements which have been made.

The selection of regions that are promising, as far as the search for radioactive ores from planes is concerned, is usually made on the basis of a structural analysis of metallogenic characteristics and of a consideration of paleogeographic conditions. The prospecting is done by groups of qualified geologists and geophysicists and involves three closely connected stages, i. e., the search for anomalies, the prospecting for

Sum. 1360

BAKANDY, V.I.

deposits on the basis of the anomalies found, and the evaluation of deposits. Experience acquired in searching for deposits of uranium and thorium from planes and in the interpretation of the results obtained indicates that a correlation between a heightened radioactivity of rocks and the occurrence of deposits is not always observed, so that a heightened radioactivity of rocks cannot be regarded as the sole criterion for the presence of deposits. Extensive fields exhibiting any level of activity may prove to be equally promising. Furthermore, one cannot evaluate individual anomalies solely on the basis of their shape and intensity without correlating all geophysical and geological data as well as taking into consideration local characteristics.

The following procedures have been developed, which assure the detection of all areas that are of interest from the practical standpoint independently of the intensity of the radiation on the surface: (1) detailed treatment of the area of the anomaly by aeroradiometric surveying which involves repeated flights, lowering of the altitude, and an increasing density of coverage; (2) a geological correlation and interpretation of the recordings of an anomaly; and (3) surface checking of the anomalies, including radiometric surveying and an adequate amount of mining work and mechanical drilling." (U)

Sum. 1340



BARANOV, V. I.

✓ 4103 AEC-tr-2435((Pt. 2) (p. 65-78))

RADIOCHEMICAL INVESTIGATION OF THE FISSION OF  
BISMUTH, THORIUM AND URANIUM WITH 480 MEV

PROTONS. A. P. Vinogradov, I. P. Allmarin, V. I.

Baranov, A. K. Lavrukina, T. V. Baranova, F. J.

Pavlovskaya, A. A. Bragina, and Yu. V. Yakovlev. p. 65-

78 of CONFERENCE OF THE ACADEMY OF SCIENCES OF

THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY,

JULY 1-5, 1955. SESSION OF THE DIVISION OF CHEM-

ICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian  
and appeared in Nuclear Science Abstracts as NSA 9-7938.

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for

USSR/Cosmochemistry - Geochemistry. Hydrochemistry, D

Abst. Journal: Referat Zhur - Khimiya, No 1, 1957, 699

Author: Baranov, V. I.

Institution: Academy of Sciences USSR

Title: On the Effect of External Conditions on Radioactive Disintegration

Original

Periodical: Byul. khim. po opredeleniyu absolyut. vozrast geol. formatsiy AN SSSR  
1955, Vol 1, 77-79

Abstract: The work of many authors has shown that the effect of external conditions, e.g., temperature, pressure, magnetic field, cosmic radiation, etc, has no practical significance in the determination of geologic age within the limits of error of the radioactive methods applied.

Card 1/1

BARANOV, V.I.

Present-day concept of the problem concerning the age of the earth.  
Razved.i okh.nedr 21 no.6:1-6 N-D '55. (MLRA 9:12)

(Earth--Age)

VOYTKOVICH, Georgiy Vitol'dovich; BARANOV, V.I., redaktor; GODOVIKOVA, L.A.,  
redaktor izdatel'stva; PENKOVA, S.A., tekhnicheskiy redaktor

[Radiogeology and its significance in learning the history of the  
earth] Radiogeologiya i ee znachenie v posnanii istorii Zemli.  
Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po geol. i okhrane neдр,  
1956. 110 p. (MLRA 9:11)

(Nuclear geophysics)

BARANOV, V.I.; VINOGRADOV, A.P., akademik, otvetstvennyy redaktor;  
SHEYNBOV, G.Yu., redaktor izdatel'stva; KASHINA, P.S., tekhnicheskoy redaktor

[Measurement of radioactivity] Radiometriya. Izd. 2-oe, ispr.  
Moskva, Izd-vo Akademii nauk SSSR, 1956. 343 p. (MLR 9:11)  
(Radioactivity--Measurement)

BARANOV, V. I.

4105 10 11  
✓ PRACTICAL HANDBOOK IN RADIOCHEMISTRY. AN. N.  
Kosmanov, V. I. Baranov, K. E. Zakharenko, R. P.  
Rudenko, and Yu. A. Prizhikov. State Publishers of Scien-  
tific and Technical Literature, Moscow, 1958. 352p. (In  
Russian)

The handbook is divided into chapters covering the tech-  
niques of measurements of radiation, investigation of  
radioactive transformations, production of radioactive iso-  
topes, and their application as labeled atoms. Each chapter  
carries a short theoretical introduction to the practical ex-  
periments. A special chapter is devoted to descriptions of  
the equipment for radiochemical laboratories and personnel  
protecting techniques. The handbook is planned for the use  
of personnel working in radiochemical laboratories using  
radioisotopes. (R.V.J.)

7  
1/2

BARANOV, V. I.

USSR/Cosmochemistry - Geochemistry. Hydrochemistry.

D.

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 30393

Author : Baranov, V.I., Tleubergenova, G.

Inst :

Title : Use of the Method of Microradiography Utilizing Liquid Emulsions in the Study of the Content and Distribution of Radioactive Elements in Rocks

Orig Pub : Geokhimiya, 1956, No 2, 62-67

Abst : The method which has been developed for utilizing liquid emulsions in the study of the content and distribution of radioactive elements in rocks, consists in a direct application of the emulsion to the polished section of rock. In this work liquid emulsion of type  $A_2$  was utilized. Surface of the sections was cleaned with ethyl alcohol prior to coating. Emulsion is applied to the section dropwise, and is uniformly distributed over the entire surface of the section. For a

Card 1/2

USSR/Cosmochemistry - Geochemistry. Hydrochemistry.

D.

Abs Jour : Ref Zhur - Khimiya, No 9, 1957, 30393

surface of 5 cm, 5-6 drops are sufficient. The section coated with the emulsion was dried, at room temperature, for 1-1.5 day, after which thickness of the emulsion layer was of 11-13. Uniform development in depth of the emulsion layer is necessary and is effected by means of amidol developer. Study of transparent sections of the rock, coated with emulsion, was conducted with a MBI-1 microscope at 600x magnification. This method permits to investigate the distribution of radioactive elements within objects of low activity ( $10^{-3}\%$  U). The method was used to investigate specimens of quartz porphyry and of other rocks. A chart of the distribution of radioactive inclusions has been prepared. In quartz porphyry 2 generations of radioactive inclusions are clearly manifested; one of them is an early, concurrent formation of porphyry separations; the other is a later formation concomitant with the main body of the rock.

Card 2/2



BARANOV, V.I.

USSR/ Cosmochemistry. Geochemistry. Hydrochemistry

D.

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11503

Author : Baranov V.I., Ronov A.B., Kunashova K.G.

Title : On Geochemistry of Dispersed Thorium and Uranium in Clays and Carbonate Rocks of Russian Platform

Orig Pub : Geokhimiya, 1956, No 3, 3-8

Abstract : In sedimentation processes U migrates to a considerable extent in the form of soluble compounds, whereas Th -- in clastic and colloidal form. Magnitude of Th : U ratio is twice as large in clays as in carbonate rocks, and in the latter Th is contained in the insoluble portion. Clays of the Russian Platform contain on the average  $1.1 \cdot 10^{-3}\%$  Th and  $4.1 \cdot 10^{-4}\%$  U; carbonate rocks  $2.4 \cdot 10^{-4}\%$  Th and  $2.1 \cdot 10^{-4}\%$  U. Maximum content of Th is noted in rocks formed during periods of most intensive erosion of crystalline rocks or shell of weathering. Content of U in rocks of different composition and geological age varies to a considerably lesser extent than that of Th. A certain enrichment in U is observed in rocks having an increased content of organic substances.

1/1

BARANOV, V.I.

Fifth session of the Committee on determining the absolute age of  
geological formations. Geokhimiia no.3:86 '56. (MLRA 9:9)  
(Geological time--Congresses)

*R. A. S. D. M. V., V. I.*

USSR/General Problems - Methodology. Scientific Institutions and Conferences. Instruction. Questions Concerning Bibliography and Scientific Documentation. A-1

Abs Jour : Referat Zhur - Khimiya, No 8, 1957, 25639

Author : V.I. Baranov.

Inst :  
Title : Pierre Curie.

Orig Pub : Khim. nauka i prom-st', 1956, No 5, 575-578

Abstract : See also RZhKhim, 1956, 77181.

Card 1/1

- 2 -

BARANOV, V.I., professor.

In memory of Irene Joliot-Curie. Vest.AN SSSR 26 no.5:58-59 My '56.  
(MLRA 9:8)

(Joliot-Curie, Irene, 1897-)

BARANOV, V.L., professor.

Problems of age of geological formations; session in Tbilisi.  
Vest.AN SSSR 26 no.8:114-115 Ag '56. (MIRA 9:9)  
(Petrology)

Handbook on Radiometry for Geophysicists and Geologists 785

The book surveys the radioactive elements and gives their essential characteristics. Terminology and units are defined and theories of radioactivity explained. Material on apparatus and applied prospecting is limited to about 50 pages. Of particular interest is Chapter VI, dealing with the problem of determining the geological age of any given formation by radioactive methods. There are 95 tables, 21 figures, 122 Soviet references and 54 English, 4 German, and 1 French reference.

TABLE OF CONTENTS:

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Ch. I. Radioactive Transmutation	
1. General information on radioactivity	5
a) Soddy-Fajans displacement law	5
b) Periodic table (Mendeleyev's periodic system)	6
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Card 2/9	

STARIK, I.Ye., otvetstvennyy red.; SHCHERBAKOV, D.I., akademik, red.;  
BARANOV, V.I., prof., red.; SHATSKIY, N.S., akademik, red.;  
POLKANOV, A.A., akademik, red.; VINOGRADOV, A.P., akademik, red.;  
AFANAS'YEV, G.D., red.; GERLING, E.K. prof., red.; PEKARSKAYA,  
T.B., kand.geol.-min.nauk, red.; TUGARINOV, A.I., red.;  
CHERDYNTSEV, V.V., red.; POLYAKOVA, T.V., tekhn.red.

[Proceedings of the fourth session of the Commission for the  
Determination of the Absolute Age of Geological Formations,  
May 12-14, 1956] Trudy chetvertoi sessii Komissii po opredeleniiu  
absoliutnogo vozrasta geologicheskikh formatsii; 12-14 maia 1955 g.  
Moskva, 1957. 297 p. (MIRA 11:1)

1. Akademiya nauk SSSR. Komissiya po opredeleniyu absolyutnogo  
vozrasta geologicheskikh formatsiy. 2. Chlen-korrespondent  
AN SSSR (for Starik, Afanas'yev).  
(Geology, Stratigraphic)

BARANOV, V. I.

Baranov, V. I., Kuz'mina, L. A. - New Data Relating to the Grows of Cores of Deep Sea Sedimentation.

The Sixth Session of the Committee for Determining the Absolute Age of Geologic Formations at the Department of Geologic-Geographical Sciences (OGGN) of the USSR Academy of Sciences at Sverdlovsk in May 1957



BARANOV, V. I.

Baranov, V. I., Novitskaya A. P. - The Influence of Humidity on Emanation.

The Sixth Session of the Committee for Determining the Absolute Age of  
Geologic Formations at the Department of Geologic-Geographical Sciences  
(OGGN) of the USSR Academy of Sciences at Sverdlovsk in May 1957

For the author, see: *Izv. Akad. Nauk SSSR, Ser. Geol.*, 1958, No. 1, p. 115. Author: *Pekarskaya, T. P.*



BARANOV, V. I. and KUZ'MIN, L. A.

"Determination of the Velocity of the Formation of Salt on the Bottom of the Ocean Floor."

Report presented at the UNESCO Conf. on Utilization of Radioactive Isotopes in Scientific Research, Paris, 9-20 Sept 1957.  
Vestnik AN SSSR, 28, No. 1, 1958, (author Vinogradov, A. F.)

Content of radioactive elements in the bottom deposits of the Pacific Ocean in the region of the Japanese Islands. V. I. Babinov and L. A. Kuznetsov. (Vestnik Akad. Nauk SSSR, Moscow). *Geokhimiya* 1957, No. 1, 82-82. This paper was to elucidate the relationship of the behavior of  $^{137}\text{Cs}$ ,  $^{90}\text{Sr}$ ,  $^{60}\text{Co}$ ,  $^{59}\text{Fe}$ , and  $^{54}\text{Mn}$  content in 5 columns and 5 samples obtained by bottom dredging.  $^{137}\text{Cs}$ ,  $^{90}\text{Sr}$ ,  $^{60}\text{Co}$ ,  $^{59}\text{Fe}$ , and  $^{54}\text{Mn}$  were found. The content of  $^{137}\text{Cs}$  in the upper layer was approx. 5 to 0 p.p.m., the  $^{90}\text{Sr}$  amounted to 2-3 p.p.m. and the  $^{60}\text{Co}$  ratio fluctuated from 1.5 to 4.5. From the studies a great constancy was found for the  $^{137}\text{Cs}$  content. This indicated absence of migration of isotope of  $^{137}\text{Cs}$ . The  $^{90}\text{Sr}$  content of  $^{90}\text{Sr}$  more regularly decreased with depth thus explaining the more complex mechanism of increase of  $^{90}\text{Sr}$  on the sea bottom, rather than simple absorption by sesquioxides. Gladys S. Macy

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1-500M

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5006

BARANOV, V.I.

Fiftieth anniversary of Pierre Curie's death; 1859-1906. Biul.  
Kom.po opr.abs.vozr.geol.form. no.2:108-111 '57. (MLRA 10:4)  
(Curie, Pierre, 1859-1906)

BARANOV, V.I.

✓ Age of meteorites. V. I. Baranov. Geokhimiya 1957, No. 2, 165-66. — Review with 18 references. L. K. K.

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*Baranov, V.I.*

BARANOV, V.I.

Lead isochrones for rocks and the age of the earth crust [with  
summary in English]. Geokhimiia no.7:638-639 '57. (MIRA 11:1)

1. Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo  
AN SSSR, Moskva.

(Lead--Isotopes) (Nuclear geophysics)

BARANOV, V.I.

Using the compensation method for the determination of actinium  
in small quantities. Trudy Radiev. inst. AN SSSR 5 no.2:31-36  
'57. (MLRA 10:8)

(Actinium)



BARANOV, V.I.

Radiometric methods. Zhur. anal. khim. 12 no.5:600-605 S-0 '57.

(Radiometer)

(MIRA 10:11)

(Oil well logging, Radiation)

*Baranov, V.I.*

AUTHOR: Baranov, V.I., Professor 30-8-25/37  
TITLE: On the Determination of the Absolute Age of Geological Stratifications (Opredeleniye absolyutnogo vozrasta geologicheskikh formatsiy)  
PERIODICAL: Vestnik Akademii Nauk SSSR, 1957, Vol 27, Nr 8, pp 100-101 (USSR)  
ABSTRACT: The VI. session of the commission for the determination of the absolute age of the above-mentioned stratifications took place at Sverdlovsk from May 22nd to May 27th. Geologists from Moscow as well as other large cities of the USSR participated in this session. The research results obtained by L.V. Komlev (Institute for Radiation Research) as well as those obtained by A.P. Vinogradova (Institute for Geochemistry and Analytical Chemistry) were well received by the participants. Special interest was caused by the reports made by a group of geologists who, during the V. and VI. session, succeeded in carrying out the geological distribution of the magmatic stratifications in the North Caucasus. It was possible to state four complexes:  
1.) Granite complex of the main mountain range: 450-270 million years,  
2.) Complex of the so-called northern granite: 230-210 million years.

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On the Determination of the Absolute Age of Geological Stratifications <sup>30-8-25/37</sup>

- 3.) Complex of neointrusive stratification,
- 4.) Kainosoic complex (40-30 million years and 50-25 million years respectively).

The contents of several of the reports proved that the investigation of the absolute age was carried out by means of the K/Ar method.

The next session will take place at Moscow and a number of methodical problems will be dealt with.

AVAILABLE: Library of Congress  
Card 2/2

*Baranov V.I.*

26-10-7/44

AUTHORS: Alimarin, I.P. and Saukov, A.A., Corresponding Members of the USSR Academy of Sciences, and Baranov, V.I. and Koval'skiy, V.V., Professors

TITLE: Problems of Contemporary Geochemistry (Problemy sovremennoy geokhimii)

PERIODICAL: Priroda, October 1957, No 10, pp 53-62 (USSR)

ABSTRACT: The article deals with the activities of the Institute of Geochemistry and Analytical Chemistry Imeni V.I. Vernadskiy of the AN USSR (Moscow). Contemporary geochemistry researches the distribution and reactions of chemical elements in the various strata of our planet, the origin and absolute age of rocks and deposits and the migration and concentration of elements under the influence of organisms. This young science is closely related to its initiators, Academicians V.I. Vernadskiy and A.E. Fersman. The Institute has 12 laboratories in isotopes, radiochemistry, biogeochemistry, radiogeochemistry, rare elements, geochemistry of single elements, magmatogenic processes, mineralogical structures, organic reagents, spectral analyses, sedimentary rocks and crystallo-chemistry.

Card 1/2

Problems of Contemporary Geochemistry

26-10-7/44

Geochemistry of isotopes is the latest field of research and is making rapid progress, as the use of isotopic shifts enables the establishment of the history and conditions of formation of natural objects with great exactness. Other objects investigated by the Institute are the distribution of especially rare and scattered seas, the influence of chemical elements of the environment on organisms in areas lacking or abounding in certain elements, and diseases of plant and animal organisms resulting therefrom.

The article contains 6 photos, 2 graphs, 1 schematic map.

ASSOCIATION: Institute of Geochemistry and Analytical Chemistry Imeni V.I. Vernadskiy of the USSR Academy of Sciences (Institut geokhimii i analiticheskoy khimii imeni V.I. Vernadskogo AN SSSR) Moscow

AVAILABLE: Library of Congress

Card 2/2

ZABORENKO, Kaleriya Borisovna; BARANOV, V.I., prof., zasluzhennyy deyatel' nauki; KATRENKO, D.A., red.; AKHLAMOV, S.N., tekhn.red.

[Radioactivity] Radioaktivnost'. Pod red. V.I.Baranova. Izd. 2-oe, dop. Moskva, Gos.izd-vo tekhniko-teoret. lit-ry, 1958. 79 p.  
(Nauchno-populiarnaya biblioteka, no.54) (MIRA 11:6)  
(Radioactivity)

BARANOV, V.I.

International Conference on the Use of Radioisotopes in Scientific  
Research (Paris, Sep. 9-20, 1957). Geokhimiia no.2:178-179 '58.  
(Paris--Radioisotopes--Congresses) (MIRA 12:4)

AUTHORS:

Baranov, V. I., Doctor of Physico-Mathematical Sciences, Knorre, K. G., Candidate of Geological-Mineralogical Sciences 30-58 3-38/45

TITLE:

Method of Determination of the Absolute Age of Geologic Formations (Metodika opredeleniya absolyutnogo vozrasta geologicheskikh formatsiy)  
Symposium in Leningrad (Simpozium v Leningrade)

PERIODICAL:

Vestnik Akademii Nauk SSSR, 1958  
(USSR)

Nr 3, pp. 112-113

ABSTRACT:

The commission for the determination of the absolute age of geologic formations at the Department for Geological and Geographical Sciences at the AS USSR held a symposium in Leningrad within the period from December 10<sup>th</sup> to December 14<sup>th</sup>, 1957, which was devoted to the methods of age determinations. Much attention was paid to the potassium-argon method by reports of the collaborators of the All Union Geological Institute, of the Laboratory for Pre-Cambrian Geology, as well as of the Daghestan-branch of the AS USSR.

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Method of Determination of the Absolute Age of Geologic Formations 30-58-38/45  
Symposium in Leningrad

It was found again at this occasion that argon precipitates from minerals at high temperatures (up to 800 to 900°C and more) and at high pressure. It is investigated at present which minerals are fit for the determination of the absolute age by means of the potassium-argon method. R. I. Shur reported on a device for the accelerated determination of argon-content which was developed in the Mineral and Geological Institute, Sverdlovsk. The method of determination of micro-quantities of thorium was substantially improved in the Radium Institute imeni V. G. Khlopin. N.I. Polevaya (All-Union Geological Institute) reported on a determination of age by means of potassium-calcium method which was carried out for the first time in the USSR. The use of glauconite for the determination of the age of sedimentary rocks was equally described. The investigation isotopic composition of lead in radioactive minerals was developed in recent years. These investigations were commenced by a group of collaborators of the Institute for Geological and Analytical Chemistry imeni

Card 2/3

Method of Determination of the Absolute Age of Geologic  
Formations. Symposium in Leningrad

30-58-3-38/45

V. I. Vernadskiy. E. V. Sobotovich and other collaborators  
of the Radium Institute reported about tests for the  
determination of lead in radioactive minerals. It proved  
necessary to hold periodical consultations concerning these  
problems.

Card 3/3

AUTHORS: Baranov, V. I., Surkov, Yu. A.,  
Vilenskiy, V. D. SOV/7-58-5-8/15

TITLE: On the Presence of an Isotopic Shift in Natural Uranium  
Compounds (O sushchestvovanii izotopnykh sdvigov v prirodnykh  
soyedineniyakh urana )

PERIODICAL: Geokhimiya, 1958, Nr 5, pp 465 - 472 (USSR)

ABSTRACT: The authors tried to determine whether by the easier mobility  
of  $U^{234}$  a disturbance of the radioactive equilibrium in  
secondary and displaced minerals may occur. The samples were  
supplied by I.G.Chentsov, V.S.Serebrennikov and G.A. Volkov  
from the Institut geologii rudnykh mestorozhdeniy, petrografii,  
mineralogii i geokhimii AN SSSR (Institute for the Geology  
of Ore Deposits, Petrography, Mineralogy and Geochemistry AS  
USSR). Two of the 14 samples investigated were uranium pitch  
blende. 1 was uranium containing water, 3 were uranium black,  
3 were uranium bearing bituminous limestones, and 4 were  
albitized Kalsinters rich in phosphorite. The samples 4 to  
13 were leached out with hydrochloric acid and hydrogen per-  
oxide, or with hydrochloric acid and calcium nitrate. The  
substance leached out and the residue were investigated

Card 1/3

On the Presence of an Isotopic Shift in Natural  
Uranium Compounds

SOV/7-55-5-8, 15

separately. In some samples several fractions (up to 3) of different granular size were investigated. The authors first extracted uranium with ether from the samples and then by means of the ion-exchanger, Dowex-1 (Dauks-1). The extracted uranium was separated electrolytically on steel platelets. The alpha spectra were measured by means of a special apparatus; this apparatus is shown in a photograph (Fig 1) and in form of a block scheme (Fig 2). It mainly consists of the ionization chamber, the pre-amplifier, the amplifier with the discriminator, and the 50 channels amplitude analyzer. The spectra are recorded by means of an oscillator; the principle of recording is explained in figure 3. The alpha spectra of three samples are given (Figs 3a, 3b, 3v). The calculatory evaluation of the measuring results is dealt with a special chapter. A table gives all values obtained. It shows that in uranium pitch blende a radioactive equilibrium exists, that uranium containing water exhibits a concentration of  $U^{234}$ . In the bituminous limestones the values are in all places close to the equilibrium; the uranium content is probably connected with the petroleum bearing water as in bitumen the uranium content as well as the

Card 2/3

On the Presence of an Isotopic Shift in Natural  
Uranium Compounds

SOV/7-56-5-8/15

relative content of  $U^{234}$  are increased. In the phosphorite-rich Kalsinters  $U^{234}$  is concentrated when hydrothermal waters have acted upon the rock; otherwise there is radioactive equilibrium. There are 3 figures, 1 table, and 6 references, 5 of which are Soviet.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo AN SSSR, Moskva (Moscow, Institute for Geochemistry and Analytical Chemistry imeni V.I. Vernadskiy, AS USSR)

SUBMITTED: January 27, 1958

Card 3/3

BARANOV, V.I.; KNORRE, K.G.

The ~~Seventh~~ Session of the Commission for determination of the  
absolute age of geological formations (Moscow, 1958). Geokhimiia  
no.5:505-506 '58. (MIRA 11:10)  
(Geological time--Congresses)

AUTHORS: Baranov, V. I., Knorre, K. G.

SOV/7-58-5-12/5

TITLE: Chronicle. Transactions of the Seventh Session of the Commission for Determination of the Absolute Age of Geological Formations (Moscow, 1958)(Khronika. VII sessiya Komissii po opredeleniyu absolyutnogo vozrasta geologicheskikh formatsiy /Moskva, 1958 g./)

PERIODICAL: Geokhimiya, 1958, Nr 5, pp 506 - 507 (USSR)

ABSTRACT: The VII regular session of the Commission for the Determination of the Absolute Age of Geological Formations at the Department of Geological and Geographical Sciences AS USSR took place in Moscow from May 8 to 12, 1958. About 60 lectures were delivered by scientists from Moscow, Leningrad, Kiev, Sverdlovsk, Makhach-Kala and other towns of the USSR; they dealt with the geological chronology of various areas. Also a number of methodical informations were submitted. The opening speech was held by D.I. Shcherbakov, Member, Academy of Sciences, USSR. A.A. Pol'yanov spoke about the geochronology of the Precambrian of the Baltic Shield. N.P. Semenko showed that the Precambrian of the entire planet may be divided into four cycles each of

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Chronicle. - Transactions of the Seventh Session of the Commission for Determination of the Absolute Age of Geological Formations (Moscow, 1958) SOV/7-58-5 13/15

the order of million years on the basis of the determinations of their absolute age: 1) 3200 - 2700 mill. years. 2) 2600 - 1900 mill. years. 3) 1800 - 1200 mill. years. 4) 1100 - 500 mill. years. Then follows the cycle of the Late Cambrian 400 - 300 mill. years. A number of lectures dealt with the geochronology of single regions: Ukraine (L.V. Komlev et al.), Ural (L.P. Ovchinnikov), Eastern Germany (the group of A.P. Vinogradov). The Bulgarian scientist Jordanov dealt with the problems concerning the plutonic rocks in Bulgaria. A.Ya. Krylov spoke about the employment of the argon method in weathered sedimentary rocks. The seventh session brought about a change in the opinion of the geologists about the determination of age. The methods of the determination of the absolute age are now fully acknowledged as working method, just like chemical analysis. Independent laboratories were built for the individual regions. The argon method which earlier was still in the experimental stage has now become a classical method. E.K. Gerling spoke about the new constant for the K capture of  $K^{40}$  when the new value is used in the calculation higher values

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Chronicle.- Transactions of the Seventh Session of SSV/7-58-5-13/15  
the Commission for Determination of the Absolute Age of Geological Formations  
(Moscow, 1958)

for the age are obtained. In connection herewith A.P. Vinogradov, Member, Academy of Sciences, USSR, suggested to drop the certification of the age determinations practiced by the commission. A great number of lectures dealt with the problem of the conservation of argon in minerals used for the determination of age. In the contribution submitted by the collaborators of the Daghestan Branch of the AS USSR (Dagestanskiy filial AN SSSR) a new method was suggested for the separation of that part of argon and potassium which is conserved best. N.I. Poleva spoke about the first work in the USSR dealing with the K/Ca method of age determination. Since already a considerable amount of reliable age determinations has accumulated it may be started to compile a Soviet geochronological scale. A commission was set up for this purpose, which was joined by the leading scientists in the field of geochronology.

Card 3/4

Chronicle. - Transactions of the Seventh Session of SOV/7-58-5-13/15  
the Commission for Determination of the Absolute Age of Geological Formations  
(Moscow, 1958)

Card 4/4

BARANOV, V.I.

Latest data on the determination of the absolute age of the earth  
[with summary in English]. Vop. kosm. 6:39-55 '58. (MIRA 11:10)  
(Earth--Age)

7(5) 3(0)

AUTHORS:

Baranov, V.I., Khristianov, V.K.

SOV/7-58-7-9/13

TITLE:

Borometric Profiling by the Neutron Method  
(Borometricheskoye profilirovaniye neytronnym metodom)

PERIODICAL:

Geokhimiya, 1958, Nr 7, pp 680 - 681 (USSR)

ABSTRACT:

To state the boron content in soils the authors have developed the following method: a neutron source in the intensity of  $1.10^7$  n/sec is fixed under a water reflector, 24 cm next to a neutron end-detector. The appliance is moved with 4 - 5 km/h, the intensity is recorded visually with an indicating instrument. By its absorption of neutrons 0.01%  $B_2O_3$  can be ascertained. A depth up to 10 - 15 cm can be examined. A figure shows the boron distribution which has been fixed for a length of 1.5 km. There are 1 figure and 3 Soviet references.

ASSOCIATION:

Institut geokhimii i analiticheskoy khimii im.V.I.Vernadskogo  
AN SSSR, Moskva (Institute for Geochemistry and Analytical  
Chemistry imeni V.I.Vernadskiy, AS USSR, Moscow)

Card 1/2

*BARANOV, V. I.*

AUTHORS: Baranov, V. I., Babeshkin, A. E., Zaborenko, K. B. 78-1-3/43

TITLE: ~~The~~ Problem of Behavior of Natural Radioactive Isotopes (K voprosu o povedenii yestestvennykh radioaktivnykh izotopov).

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 1, pp. 16-19 (USSR).

ABSTRACT: The explanation of the migration mechanism of radioactive elements in nature is one of the most important problems of modern science. From their quantitative relations we can learn the peculiarities of the reaction of single elements (reference 1). According to Starik's theorem (reference 2) their reaction is determined by their form of occurrence. The atoms of mother-elements (uranium, thorium) form part of the crystal lattice of the initial compounds. The atoms of the products of radioactive decomposition have chemical and crystallographic properties different from the latter. The atoms of the decomposition products are capable of leaving their position while losing recoil energy and to enter the widely spread capillary network which is filled with water. The further fate of the recoil atoms is determined by diffusion processes. The radium isotopes are lixiviatable to a large extent as radium forms always a decomposition product at the ratio mother-substance -uranium, which forms part of the crystal lattice. The authors formed the task of studying the problem mentioned in the

Card 1/3

The Problem of Behavior of Natural Radioactive Isotopes

78-1-3/43

title for that case in which the isotopes are crystal forming. They should furtheron be compared with the reaction of the decomposition products (e. g. thorium isotopes) the crystal lattice of which is different. As for the solution of this problem natural formations can not be used the authors chose barium compounds the crystal lattice of the radium compounds of which are isomorphous ( $\text{BaSO}_4$ ,  $\text{BaCrO}_4$ ,  $\text{BaCO}_3$ ).

These salts were precipitated from solutions which contained Ra-226 and Ra-228. Because of radioactive transformations the isotopes Th-228 and Ra-224 are produced from them. According to table 1 Th-228 passes in all cases to the solution to a much smaller extent than radium isotopes. The transition of the radium isotopes Ra-224, Ra-226 and Ra-228, which from the beginning took part in the crystal lattice of the compound, to the solution follows the Khlopin theorem. Ra-224, which developed because of radioactive transformations in all cases passes over to the solution to a greater extent than Ra-228 and Ra-226 (table 1). For the salts investigated here the maximal ratio:

Ra-224 or Ra-224,  
Ra-228 Ra-226

referring to the monolayer, can reach the remarkable value  $\sim 25$ . Should the exchange process cover a number of layers which is equal to the range the ratio must be:

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The Problem of Behavior of Natural Radioactive Isotopes.

70-1-3/L3

$\frac{\text{Ra } 224}{\text{Ra } 228} = 1$ . As can be seen from table 2 this ratio decreases in the solution with the increasing number of layers entering the exchange. The ratio between radioactive isotopes, passing over to the solution, depends on a number of factors: the range of the recoil atom of the isotope forming, the size of particles, the gaps between the particles, the composition and the thickness of the medium in the gaps, the time which passed since the formation of the surface, the decay constant of the isotope forming and the number of the layers of the solid substance taking part in the exchange. The experimental results are in good agreement with the mechanism proposed. There are 3 tables, and 6 Slavic references.

ASSOCIATION: Moscow State University imeni M. V. Lomonosov, Laboratory For Radiochemistry of the **Chemistry Dept.** (Moskovskiy gosudarstvennyy universitet imeni M. V. Lomonosova, Laboratoriya radiokhimii khimicheskogo fakul'teta).

SUBMITTED: June 18, 1957.

AVAILABLE: Library of Congress.

Card 3/3

BARANOV, V. I.

AUTHORS:

Baranov, V. I., Korobkov, V. I.

TITLE:

Application of the Radioautographic Method for the Control of Radiochemical Purity of a Radioactive Substance  
(Primeneniye metoda radioavtografii dlya kontrolya radiokhimicheskoy chistoty  $\alpha$ -radioaktivnykh veshchestv)

PERIODICAL:

Zhurnal Neorganicheskoy Khimii, 1955, Vol. 3, No. 2, pp. 184-186 (USSR)

ABSTRACT:

After a short review on the history of this method since 1896, the authors describe the state of the art at present for the application of this method and accentuate its advantages. In the present paper the problem was set to control  $\text{Th}^{230}(\text{Io})$ , which is used for determining the age of young geological formations, for the study of the migration of Th and for other purposes. The possibility of such a control may be proved with 2  $\text{Th}^{230}$  preparations:  
1) a preparation consisting of a natural ore material, virtually free from Thorium (reference 1), and 2) a preparation obtained from the latter by special purification

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Application of the Radioautographic Method for the Control of Radiochemical Purity of  $\alpha$ -Radioactive Substances 1964/67

by means of electrolysis. For photoplates RIKKEI Type A-2 a graduation curve of the dependence of the range of  $\alpha$  particles in the emulsion of the radiation dose was constructed. For this purpose solutions with isotopes

$U^{238}$ ,  $U^{234}$ ,  $Th^{232}$ ,  $Po^{210}$ ,  $Ra^{226}$ ,  $Po^{214}$  were used in

a radiochemically pure condition. Impregnation methods of the photoplates are described. The plates were investigated microscopically. The table shows the results of this investigation compared with those of two other authors. The obtained data were used to compile a graduation curve. Figure 1 shows the average range of  $\alpha$  particles in the emulsion

$\bar{R}_p$  as a function of its energy  $E$ . Figure 2 shows the dependence of  $\bar{R}_p$  of the range of the  $\alpha$  particles in air,  $R_{air}$ . From the values of the average range and the down power (t.e.) of the photoemulsion can be computed according to the formula  $t.e. = R_{air} : \bar{R}_p$  where  $\bar{R}_p$  = average range of  $\alpha$  particles in the emulsion for c.a. For t.e. of the emulsion of the applied plates amounted to from  $1/81 \pm 1$  to  $1/81 \pm 6$ . Before radiographing both preparations were stored for a

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Application of the Radiantographic Method for the Determination of Radiochemical Purity of  $\alpha$ -Radioactive Substances 10-134/43

sufficient long time in order to let  $Th^{232}$  (half) decay. The results of measuring preparation 1) are shown in figure 3,a. From this can be seen, that the preparation as was expected is not chemically pure, because a simplified isolation method was used. Among the admixtures  $Po^{231}$ ,  $Po^{210}$  and apparently decay products of the thorium series were present. Altogether they amounted to  $\sim 24\%$ . From the radiographs of the second preparation (figure 3,b) is to be seen, that the quantity of foreign admixtures was decreased to  $5\%$  as a result of an additional purification. There are 3 figures, 1 table, and 5 references, 3 of which are Slavic.

ASSOCIATION: Radio Chemistry Laboratory, Dept. of Chemistry, Moscow State University im. M.V. Lomonosov (Laboratoriya radiohimii khimicheskogo fakul'teta Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova)

SUBMITTED: June 18, 1957

AVAILABLE: Library of Congress

Card 3/3

78-3-4-35/38

AUTHORS: Baranov, V. I., Babeshkin, A. M. Zaborenko, K. B.  
Pirozhkov, S. V.

TITLE: The Mechanism of the Migration of Radium- and Thorium Isotopes  
 (O mekhanizme migratsii izotopov radiya i toriya)

PERIODICAL: Zhurnal Neorganicheskoy Khimii 1958, Vol. 3, Nr 4, pp. 1054-1059  
 (USSR)

ABSTRACT: The reaction of radium and thorium isotopes, produced by the radioactive transformation in the interaction with soluble compounds the crystal lattices of which are isomorphous with radium or thorium, was investigated. The experiments were carried out with barium salts isomorphous with radium as well as with cerium salts, like  $CeO_2$  and  $Ce_2(C_2O_4) \cdot 10 H_2O$  isomorphous with the thorium isotope  $Th-228$ . The time dependence of the desorption of  $Ra-228$ ,  $Ra-224$  and  $Th-228$  from barium carbonate in barium chloride solution was determined. The desorption of radium is greater than that of thorium. Furthermore, the desorption of radium- and thorium isotopes in hydrochloric acid and aluminum chloride solutions was investigated.

Card 1/2

The Mechanism of the Migration of Radium and Thorium Isotopes 78-3-4-35/38

The desorption of Th-228 acquires the following order depending on the solution medium:  $H^+ > Al^{3+} > Ba^{2+}$ . Summarizingly it was stated that the thorium isotopes formed in the decay less easily pass over into the solution than radium isotopes, independently of the fact, whether the solid phase from which they emerge is isomorphous or not. This reaction of Th-228 is caused by its characteristic chemical features and not by the crystal form of the initial compounds. There are 7 tables and 19 references, 17 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: February 11, 1957

Card 2/2

SOV/78-3-9-31/38

AUTHORS: Baranov, V. I., Babeshkin, A. M., Zaborenko, K. B.

TITLE: The Mechanism of Migration of Radioactive Isotopes Originating in  $\alpha$ -Ray Disintegration (O mekhanizme migratsii radioaktivnykh izotopov, obrazuyushchikhsya v rezul'tate  $\alpha$ -raspada)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 9, pp 2200-2209 (USSR)

ABSTRACT: The paper under review investigates the laws governing the concentration and distribution of radioactive isotopes in solids originating in  $\alpha$ -ray disintegration. The influence exerted by various factors upon the degree of transition of radioactive isotopes from the solid to the liquid phase was examined. The experiments and comparisons were carried out with radium isotopes. The ratio between radioactive isotopes that pass from the solid phase into solution depends largely on the number of layers that take part in the exchange. The results of the experiments show that the degree of transition of radium isotopes into solution is larger in the case of  $\text{Ra}^{224}$  than in the case of  $\text{Ra}^{226}$ . If the number of layers taking part in the exchange increases the degree of transition of

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SOV/78-3-9-31/38  
The Mechanism of Migration of Radioactive Isotopes Originating in  $\alpha$ -Ray  
Disintegration

radium isotopes passing from the solid phase into solution  
decreases.

There are 1 figure, 9 tables, and 8 references, 7 of which are  
Soviet.

SUBMITTED: April 20, 1957

Card 2/2

BARANOV, V. I.  
 AUTHORS: Baranov, V. I., Zuborenko, R. B., Korobkov, V. I., 8/-2-25/35  
 TITLE: The Use of Nuclear Photoemulsions in the Determination and Evaluation of the Radiochemical Purity of  $\alpha$ -Emitting Isotopes (Primeneniye yadernykh fotoemul'siy dlya opredeleniya i otsenki radiokhimicheskoy chistoty  $\alpha$ -izluchayushchikh izotopov).  
 Periodical: Atomnaya Energiya, 1958 4, No. 1, pp. 159-162 (USSR)  
 ABSTRACT: The nuclear photoplate ИИ4КФМ 1-2 with an emulsion thickness of 50  $\mu$  was used as  $\alpha$ -indicator. For calibration of this plate the dependence of the  $\alpha$ -range in the emulsion on the energy of the  $\alpha$ -particles was determined for  $U^{238}$ ,  $U^{234}$ ,  $Th^{232}$ ,  $Po^{210}$ ,  $Bi^{212}$ - $Po^{212}$ . The recipe of production for each one of these solutions is given. The soaking of the photoplates with the solutions must be performed according to a specially elaborated recipe. The average range of the  $\alpha$ -particles was calculated with the aid of the formula:

$$\bar{R} = \frac{\sum \mu_i n_i}{\sum n_i}$$

where  $\mu$  = the length of traces in  $\mu$ , and  $n_i$  the number of traces with the length  $\mu_i$ .

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The Use of Nuclear Photoemulsions in the Determination and Evaluation of the Radiochemical Purity of  $\alpha$ -Emitting Isotopes.

For the calibration of the plate the following ranges were measured:

Th <sup>232</sup>	$14,9 \pm 1,5 \mu$
U <sup>238</sup>	$16,4 \pm 2,6 \mu$
Po <sup>210</sup>	$22,7 \pm 2,2 \mu$
Bi <sup>212</sup>	$27,7 \pm 3,9 \mu$
Po <sup>212</sup>	$47,2 \pm 4,7 \mu$

These ranges are in good agreement with the corresponding values for Ilford C-2 plates. The measurement Th<sup>230</sup>(I<sub>0</sub>) is described as an example of identification. The range of these  $\alpha$ -particles was determined with  $18,87 \pm 0,03 \mu$ , the Th<sup>230</sup>-solution not having been subjected to any special purification. When the Th<sup>230</sup>-solution is electrolytically purified, which causes a reduction of foreign bodies to 5%, the measurement of range yield  $\bar{R} = 18,94 \pm 0,03 \mu$ . Both measurements are in good agreement. There are 5 figures, 1 table, 11 references, 5 of which are Slavic.

SUBMITTED: January 4, 1957  
 AVAILABLE: Library of Congress  
 Card 2/2 1. Alpha particles-Photographic analysis





The measurement of the  $\beta$  decay of  $^{150}\text{Eu}$  is a sensitive test of the  
conservation of angular momentum.

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3(8), 3(0)

507/7-55-1-2/12

AUTHORS: Karanov, V. I., Surkov, Yu. A., Vileniskiy, V. D.

TITLE: On the Existence of Isotope Shifts in Natural Thorium Compounds  
(O sushchestvovanii izotopnykh sdivgov v prirodnykh soye-  
dinennyakh toriya)

PERIODICAL: Geokhimiya, 1959, Nr 1, pp 69-75 (USSR)

ABSTRACT: The formation pattern of  $\text{Th}^{230}$  from  $\text{Th}^{232}$  is as follows:  
 $\text{Th}^{232} (\alpha) \text{Ra}^{226} (\beta) \text{Ac}^{226} (\beta) \text{Th}^{228} (\alpha) \dots$  As a rule it is  
assumed that a shift in the isotope ratio - e.g. because  
of the removal of intermediate products - need not be con-  
sidered. The authors investigated several samples of different  
minerals supplied by A. P. Polyakov. Thorite and monazite were  
leached out with hydrochloric acid, and the isotope ratio  
in the extraction and residue was investigated. Zirconium  
nitrate was added as carrier, precipitated as iodate and  
twice purified from Fe and traces of uranium, polonium, and  
bismuth in the anion exchanger EDE-10 P. Thorium was separated  
from zirconium by the cation exchanger KU-2 and then applied  
electrolytically to non-corroding steel discs. An apparatus  
described by the authors in reference 5 served for the determina-

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SOV/7-59-1-1/14

On the Existence of Isotope Shifts in Natural Thorium Compounds

tion of the alpha spectra. The apparatus is again described (Figs 1 and 2), and some spectra are given (Fig 3). Besides the  $\text{Th}^{228}/\text{Th}^{232}$  ratio, the  $\text{Th}^{230}/\text{Th}^{232}$  ratio was determined from the spectra (Tables 1 and 2). The investigation results show that isotope shifts occur in nature, a fact which is in future to be taken into account in radiometric thorium determinations as well as in the determination of the absolute age. There are 3 figures, 2 tables, and 11 references, 7 of which are Soviet.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo  
AN SSSR, Moskva  
(Institute of Geochemistry and Analytical Chemistry imeni  
V. I. Vernadskiy AS USSR, Moscow)

SUBMITTED: October 16, 1956

Card 2/2

EARANOV, V.I.; BARSUKOV, V.L.

Use of geochemical and geophysical methods in prospecting for boron. Zakonom. razm. polezn. iskop. 2:495-502 '59. (MIRA 15:4)

1. Institut geokhimii i analiticheskoy khimii imeni Vernadskogo AN SSSR.

(Boron) (Geochemical prospecting) (Radioactive prospecting)

3(5)

001/28-59-3-6/47

AUTHOR: Baranov, V.I., Professor, and Serdyukova, A.S.,  
(Moscow)

TITLE: Radiogenic Heat

PERIODICAL: Priroda, 1959, Nr 3, pp 29 - 34 (USSR)

ABSTRACT: The authors explain the circumstances which lead to formulating the problem of radiogenic heat on the basis of which the theories of radiogenic melting and motion of the earth crust arose, in particular the new radiomigration theory of V.V. Belousov. The problem of radiogenic heat is at present far from a complete solution, but some experimental material has already been accumulated, and theoretic computations have been made, the results of which are expounded in this article. Processes are taking place in the earth which are accompanied by an irreversible loss of energy, the amount of which can be approximately determined. The authors explain and give particulars on the loss of heat

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SOV/26-59-3-6/47

### Radiogenic Heat

because of thermal conductivity in various regions of the globe, quoting for this purpose table 1. Table 2 contains details on the volume of heat given off at the eruption of volcanos and from thermal sources. In the earth, there are sources of thermal energy replenishing the irreversible discharge. Speaking of compression or differentiation of a substance in the gravitational field, the authors point out that - according to the old computations of Fisher and Lun-compression could produce an amount of heat that would suffice to melt the earth. However, according to the computations of Ye.A. Lyubimova, the heating-up of the earth, which was formed by the fusion of cold particles, could not bring it to melt at a blow or compression. Chemical reactions may be the source of thermal energy, but this question has scarcely been touched by research. Another calculable source is the decay of radioactive elements. Numerous data

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001/26-59-3-6/87

### Radiogenic Heat

is at present available on the content of radioactive elements in various rocks. The energy of radiation of the natural radioactive elements and the amount of heat emanated by them are exactly known. The corresponding values are given in tables 3 and 4. The authors comment on them, quoting several formulas. They state that the question of distribution of radiogenic heat in the entire mass of the earth is less clear. But it is essential to know this distribution so as to ascertain the amount of generated heat and to calculate the temperatures and their changes in the long run for various layers of the earth. The chemical composition of deep layers of the earth is often judged in analogy with the composition of stone and iron meteorites. The calculation of the amount of heat emanating from the depths is therefore approximate. One may think that with increasing depth the contents of radioelements decreases. Calculations

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Radiogenic Heat

based on this assumption were made for the first time in 1937 by V.G. Khlopin. It proved that the quantity of heat liberated because of the decay of radioactive elements amounted to approximately  $4 \cdot 10^{21}$  cal/year. According to better substantiated calculations of G.V. Voytkovich, the amount of radiogenic heat on the entire earth amounts to about

$4 \cdot 10^{20}$  cal/year. The authors further deal with two important problems connected with radiogenic heat: the distribution of temperature in the earth at present and in past epochs, and the possibility of its heating within certain limits. In this connection the authors refer to A.P. Sokolov who came to the conclusion that the earth is not in a thermal equilibrium, but warms up. Proceeding from the cosmogonic theory of O.Yu. Schmidt, Ye.A. Lyubimova

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Radiogenic Heat

made calculations on the amount of heat liberated by the decay of radioactive elements. From these calculations follows that, as a result of radioactive decay, a considerable quantity of heat was liberated and used for the warming of rocks. But this could not result in a complete melting of the earth, as at that time the temperature was below the melting point or exceeded it only at some depths. The authors set forth further considerations on temperatures prevailing in the earth in previous epochs which influenced the formation of earth, quoting Berch, H.C. Urey and L.K. Greyton. They deal with the possibility of accumulation of considerable energy in confined sections and the formation of hearths of liquid magma. Calculations have shown that under normal heat conductivity of rocks, it can hardly be expected that heat will accumulate to form a melted cover at a comparatively small depth. Speaking of the present state of the

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Radiogenic Heat

problem of radioactive heat, the authors formulate it as follows: the loss of heat by the earth by heat conductivity can undoubtedly be abundantly covered by radiogenic heat. It is possible that radiogenic heat could have caused a melting of the earth which was cold at the beginning in its early stage of existence  $(4 \div 6) \cdot 10^9$  years ago. A decisive role of radiogenic heat in regional initial heating has not been proved. The problem of radiogenic heat requires further thorough researches. It should be the task to draw up a radiogeological chart of the earth, and of individual sections, but in the first place of districts of thermal anomalies; to conduct theoretical and experimental studies on the heat conductivity of rocks both in laboratories and at places of occurrences; to carry out theoretical calculations on the thermal conditions of earth in its first stage of development; to define more

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SOV/26-59-3-6/47

Radiogenic Heat

accurately the distribution of radioactive elements on the entire earth. There are 6 tables, 1 graph, and 17 references, 14 of which are Soviet and 3 American.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo Akademii nauk SSSR (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the USSR Academy of Sciences).

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3(5), 5(4)

SOV/7-59-6-7/17

AUTHORS:

~~Baranov, V. I.~~, Morozova, N. G., Kunasheva, K. G., Babicheva,  
Ye. V., Karasev, B. V.

TITLE:

On the Radiometric Method of Prospecting for Natural Gas and  
Petroleum Deposits

PERIODICAL:

Geokhimiya, 1959, Nr 6, pp 530 - 537 (USSR)

ABSTRACT:

In the course of the research work of the Institut nefti AN  
SSSR (Institute of Petroleum of the AS USSR) under the direction  
of Professor F. A. Alekseyev negative gamma anomalies were  
found to exist in petroleum- and natural gas deposits of the  
USSR (Refs 5 - 9). The Institut geokhimii i analiticheskoy  
khimii im. V. I. Vernadskogo (Institute of Geochemistry and  
Analytical Chemistry imeni V. I. Vernadskiy) instructed a group  
of scientists under the direction of N. G. Morozova to find the  
reasons for this phenomenon; the scientists assisted in the pro-  
specting work of the Laboratory of F. A. Alekseyev. The Labora-  
tory placed the gamma pictures taken from airplane and motorcar  
at the disposal of the scientists. B. V. Karasev, Ye. V. Babi-  
cheva, and A. M. Dorina made the chemical analysis of the samples  
collected, and K. G. Kunasheva and A. P. Novitskaya the radio-  
chemical determinations. The deposits of Kizyl-Kum and Gekcha

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On the Radiometric Method of Prospecting for Natural Gas and Petroleum Deposits SOV/7-59-6-7/17

in western Turkmeniya were investigated. The portion of gamma-radiative elements was determined with respect to total gamma radiation (Table 1) and graphically represented in figures 1 - 4. Beside, the radioactivity of gases was investigated in the Korobki and Aicheda deposits (Table 2). It was found that the gamma-anomalies are in perfect accordance with the distribution of the gamma radiative elements U, Ra, Th, and K in the upper layer of soil (25 cm deep). Radium was not found to play a special part as assumed by some authors. The portion of gamma-radiation of the emanation contained in gases is only a minimum (2 % approximately) of the radiation of the elements mentioned before. The change of gamma-activity is, therefore, due to lithological or structure-morphological characteristics of the petroleum-containing regions. Papers by L. N. Bogoyavlenskiy and V. I. Shashkin are mentioned. There are 4 figures, 2 tables, and 12 references, 7 of which are Soviet.

ASSOCIATION: Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo AN SSSR, Moskva (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy of the AS USSR, Moscow)

SUBMITTED: April 2, 1959  
Card 2/2

3(5)

AUTHORS:

Baranov, V. I., Knorre, K. G.

SOV/7-59-6-14/17

TITLE:

Chronicle. The VIII Session of the Commission for the Determination of the Absolute Age of Geological Formations (at the Otdeleniye Geologo-geograficheskikh nauk AN SSSR (Department of Geological-geographical Sciences AS USSR), May 18 - 22, 1959, Moscow)

PERIODICAL:

Geokhimiya, 1959, Nr 6, pp 562 - 563 (USSR)

ABSTRACT:

The 8th regular session of the (Commission on the Determination of the Absolute Age of Geological Formations) was held in Moscow from May 18 to May 22, 1959 at the Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy). A series of summarizing reports was held on age determinations in the most important parts of the USSR, which are to be presented to the 21st International Geological Congress. The following reports are concerned:

A. V. Polkanov, E. K. Gerling: Problems of the absolute age of the Precambrian of the Baltic Shield.

A. P. Vinogradov, L. V. Komlev, A. I. Tugarinov: The absolute age of the Ukrainian crystalline shield.

P. P. Semenenko, Ye. S. Burkser, and M. N. Ivantishin: Age

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Chronicle. The VIII Session of the Commission SOV/7-59-6-14/17  
for the Determination of the Absolute Age of Geological Formations (at  
the Otdeleniye Geologo-geograficheskikh nauk AN SSSR (Department of  
Geological-geographical Sciences AS USSR), May 18 - 22, 1959, Moscow)

groups of the mineralization of the rocks of the Ukraine in  
their absolute age.

A. P. Vinogradov, A. I. Tugarinov, K. G. Knorre, and Ye. V.  
Bibikova, V. V. Zhidova, S. I. Zykov: The age of the Precambrian  
rocks of the crystalline fundament of the Russian Platform.

I. Ye. Starik, A. Ya. Krylov, M. G. Ravich, Yu. I. Silin: The  
absolute age of the rocks of the eastern part of the Antarctic  
continent.

A. Ya. Krylov: The absolute age of the rocks of the Tsentral'-  
nyy Tyan' Shan' and the employment of the argon method for  
metamorphous and sedimentary rocks.

G. D. Afanas'yev: Results of the geochrony formations of the  
Caucasus.

L. P. Ovchinnikov and M. A. Garrit: Age of the geological  
formations of the Urals and the Priural'ye (Cis-Urals).

N. I. Poleva and G. A. Nurina, G. A. Kozakova: Absolute age de-  
termination of the sedimentary and volcanic formations.

L. P. Krasnyy and N. I. Poleva: Absolute age of the magmatic

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Chronicle. The VIII Session of the Commission for the Determination of the Absolute Age of Geological Formations (at the Otdeleniye Geologo-geograficheskikh nauk AN SSSR (Department of Geological-geographical Sciences AS USSR), May 18 - 22, 1959, Moscow) SOV/7-59-6-14/17

rocks of the (Soviet) Far East.

L. V. Komlev: Absolute age of the granite intrusions of Kazakhstan.

The research work of a number of laboratories, RIAN, GEOKhI, LAGED, VSEGEI, etc aroused great attention, especially a report of E. K. Gerling, Yu. A. Shukolyukov on the concentration of the isotope  $Ar^{38}$  in uranium minerals as well as the comprehensive research work carried out by the vozrastnaya laboratoriya Akademiya nauk Gruzinskoy SSR (Laboratory of Age Determination of the Academy of Sciences of the Gruzinskaya SSR) under the application of isotopic dilution and flame photometry. The determination of the age of sedimentary rocks was discussed; A. Ya. Krylov proved in his report how well radiogenic argon is conserved in desbroyed products of rocks such as boulders, sands, sandstones, clays, and muds. A. I. Tugarinov and S. I. Zykov were the first to attempt to determine the absolute age of sedimentary carbonate formations according to isotopic composition of lead. D. I. Shcherbakov

Card 3/4

Chronicle. The VIII Session of the Commission SOV/7-59-6-14/17  
for the Détermination of the Absolute Age of Geological Formations (at  
the Otdeleniye Geologo-geograficheskikh nauk AN SSSR (Department of  
Geological-geographical Sciences AS USSR), May 18 - 22, 1959, Moscow)

reminded of the resolution approved at the 7th session to draw  
standard maps for the age determination, which would serve a  
more accurate stratigraphic distribution, and the compilation  
of a Soviet table of absolute age. I. Ye. Starik spoke about  
control of standard samples of biotite, muscovite and micro-  
cline which had been collected under the direction of G. D.  
Afanas'yev. The results achieved by the individual laboratories  
are in good agreement. J. L. Jupp, Professor of Columbia  
University participated also in the session. His report on a  
new geochrony table caused vivid attention. The resolutions  
of the 8th session contain the plan of a Soviet geochrony table  
which is to be designed under the direction of a commission.  
Helmert's well-known scale is to be used as a basis of the new  
table to be drawn by Soviet scientists under consideration  
of necessary improvements and completions.

Card 4/4

KUSAKIN, N.D.; SAL'NIKOV, A.P.; BARAMOV, V.I.

Thermal conductivity of coal shapes and products of their heat  
treatment. Trudy IGI 10:196-200 '59. (MIRA 12:12)  
(Briquets (Fuel)--Thermal properties)  
(Coke--Thermal properties)

BARANOV, V.I., professor; MALYSHEVA, T.V., kand.khimicheskikh nauk

Modern radiometric methods. Khim.nauka i prom. 4 no.4:526-530  
'59. (MIRA 13:8)

(Radiation-- Dosage)